<u>**AMENDMENTS TO THE CLAIMS**</u>

Claim 1 (Currently Amended)   A decoding device, comprising:

a decoding unit operable to decode an encoded image signal obtained by encoding image frames of an image signal and by encoding additional information for creating an interpolation frame for interpolating the image frames based on a first motion vector that is a motion vector between the image frames, so as to output decoded image frames of the image signal and decoded additional information;

a motion vector detection unit operable to detect a second motion vector, which is a motion vector between the image frames of the encoded image signal decoded, based on (1) the decoded additional information output from the decoding unit and (2) the decoded image frames output from the decoding unit; and

an interpolation frame creation unit operable to create an interpolation frame, considering the detected second motion vector as the first motion vector, such that the created interpolation frame is created based on the second motion vector, the decoded image frames output from the decoding unit, and the decoded additional information output from the decoding unit,

wherein the interpolation frame creation unit obtains an interpolation motion vector from the second motion vector based on a ratio between (1) a distance in a time axis direction between the decoded image frames and (2) a distance in a time axis direction from a position of one of the decoded image frames to an interpolation position of the interpolation frame for interpolating the image frames, and creates the interpolation frame based on the interpolation motion vector and the decoded image frames,

wherein, (A) when the additional information includes (i) an interpolation method for the interpolation frame with respect to the image frames, (ii) a motion detection method for detecting

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the first motion vector, and (iii) profile information specifying a combination of information <u>that is related to the interpolation method and the motion detection method and that is included in the additional information</u>, the interpolation frame creation unit <u>specifies information included in the additional information using the profile information and</u> creates the interpolation frame based on <u>the specified</u> information included in the additional information, and

  wherein, (B) when the additional information further includes at least one of (i) residual information of the interpolation frame and an image frame corresponding to the interpolation frame, and (ii) a vector difference between a motion vector of the interpolation frame detected with respect to the image frames and a motion vector of the interpolation frame derived based on the first motion vector with respect to the image frames, <u>and when the additional information further includes the profile information specifying a combination of information that is related to (1) the interpolation method, (2) the motion detection method, (3) the residual information, and (4) the vector difference, and that is included in the additional information,</u> the interpolation frame creation unit <u>specifies the information included in the additional information using the profile information and</u> creates the interpolation frame based on <u>the specified</u> information included in the additional information.

Claim 2 (Cancelled)

Claim 3 (Cancelled)

Claim 4 (Previously Presented) The decoding device according to claim 1, wherein:

the motion detection method is included in the additional information as code information for specifying a combination of parameters of motion detection; and

the motion vector detection unit detects the second motion vector based on the parameters of the motion detection specified by the code information.

Claim 5 (Previously Presented)   The decoding device according to claim 1, wherein, when the motion detection method included in the additional information cannot be performed, the motion vector detection unit detects the second motion vector using a predetermined motion detection method determined in accordance with the motion detection method included in the additional information.

Claim 6 (Previously Presented)   The decoding device according to claim 1, wherein the additional information is information produced for every interpolation frame.

Claim 7 (Previously Presented)   The decoding device according to claim 1, wherein the motion detection method included in the additional information is information produced for every stream of the encoded image signal.

Claim 8 (Previously Presented)   The decoding device according to claim 1, wherein, when the additional information is not included in the encoded image signal, the interpolation frame creation unit creates the interpolation frame based on the decoded image frames.

Claim 9 (Currently Amended)   An encoding device, comprising:

a first motion vector detection unit operable to detect a first motion vector, which is a motion vector between image frames of an image signal;

an additional information production unit operable to produce additional information for creating an interpolation frame from the image frames and creating a motion vector for the interpolation frame, the motion vector being derived from the first motion vector based on a ratio between a distance in terms of time between the image frames and a distance in terms of time to an interpolation position of the interpolation frame, based on the first motion vector and the image frames; and

an encoding unit operable to encode the image frames and the additional information,

wherein the additional information includes (i) an interpolation method for the interpolation frame with respect to the image frames, (ii) a motion detection method for detecting the first motion vector, and (iii) profile information specifying a combination of information <u>that is related to the interpolation method and the motion detection method and that is included in the additional information,</u> ~~and~~

wherein, when a difference between an image frame obtained by a motion compensation processing unit using the first motion vector and an image frame to be processed is equal to or greater than a predetermined threshold, the additional information further includes at least one of (i) residual information of the interpolation frame and an image frame corresponding to the interpolation frame, and (ii) a vector difference between a motion vector of the interpolation frame detected with respect to the image frames and a motion vector of the interpolation frame derived based on the first motion vector with respect to the image frames<u>, and</u>

wherein the profile information specifies a combination of information that is related to (1) the interpolation method, (2) the motion detection method, (3) the residual information, and (4) the vector difference, and that is included in the additional information.

Claim 10 (Cancelled)

Claim 11 (Cancelled)

Claim 12 (Previously Presented)   The encoding device according to claim 9, wherein the motion detection method is included in the additional information as code information for specifying a combination of parameters of motion detection.

Claim 13 (Previously Presented)   The encoding device according to claim 9, wherein the additional information is information produced for every interpolation frame.

Claim 14 (Previously Presented)   The encoding device according to claim 9, wherein the motion detection method is included in the additional information as header information of a stream of the image signal.

Claim 15 (Previously Presented)   The encoding device according to claim 9, wherein the profile information is included in the additional information as header information of a stream of the image signal.

Claim 16 (Previously Presented)   The encoding device according to claim 9, wherein, when a residual between the interpolation frame created based on the image frames and the image signal corresponding to the interpolation frame is small, the encoding unit does not encode the additional information.

Claim 17 (Currently Amended)   An interpolation frame creating system for creating an interpolation frame for interpolating image frames of an image signal, the interpolation frame creating system comprising:

a first motion vector detection unit operable to detect a first motion vector, which is a motion vector between the image frames of the image signal;

an additional information production unit operable to produce additional information for creating the interpolation frame from the image frames and creating a motion vector for the interpolation frame, the motion vector being derived from the first motion vector based on a ratio between a distance in terms of time between the image frames and a distance in terms of time to an interpolation position of the interpolation frame, based on the first motion vector and the image frames;

an encoding unit operable to encode the image frames and the additional information;

a decoding unit operable to decode the encoded image frames and the encoded additional information, so as to output decoded image frames of the image signal and decoded additional information;

a second motion vector detection unit operable to detect a second motion vector, which is a motion vector between the image frames of the encoded image signal decoded, based on (1) the

decoded additional information and (2) the decoded image frames output from the decoding unit; and

an interpolation frame creation unit operable to create an interpolation frame, considering the detected second motion vector as the first motion vector, such that the created interpolation frame is created based on the second motion vector, the decoded image frames output from the decoding unit, and the decoded additional information output from the decoding unit,

wherein the interpolation frame creation unit obtains an interpolation motion vector from the second motion vector based on a ratio between (1) a distance in a time axis direction between the decoded image frames and (2) a distance in a time axis direction from a position of one of the decoded image frames to an interpolation position of the interpolation frame for interpolating the image frames, and creates the interpolation frame based on the interpolation motion vector and the decoded image frames,

wherein, (A) when the additional information includes (i) an interpolation method for the interpolation frame with respect to the image frames, (ii) a motion detection method for detecting the first motion vector, and (iii) profile information specifying a combination of information that is related to the interpolation method and the motion detection method and that is included in the additional information, the interpolation frame creation unit specifies information included in the additional information using the profile information and creates the interpolation frame based on the specified information included in the additional information, and

wherein, (B) when the additional information further includes at least one of (i) residual information of the interpolation frame and an image frame corresponding to the interpolation frame, and (ii) a vector difference between a motion vector of the interpolation frame detected with respect to the image frames and a motion vector of the interpolation frame derived based on

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the first motion vector with respect to the image frames, and when the additional information further includes the profile information specifying a combination of information that is related to (1) the interpolation method, (2) the motion detection method, (3) the residual information, and (4) the vector difference, and that is included in the additional information, the interpolation frame creation unit specifies the information included in the additional information using the profile information and creates the interpolation frame based on the specified information included in the additional information.

Claim 18 (Currently Amended)   An integrated circuit device, comprising:

a decoding section operable to decode an encoded image signal obtained by encoding image frames of an image signal and by encoding additional information for creating an interpolation frame for interpolating the image frames based on a first motion vector that is a motion vector between the image frames, so as to output decoded image frames of the image signal and decoded additional information;

a motion vector detection section operable to detect a second motion vector, which is a motion vector between the image frames of the encoded image signal decoded, based on (1) the decoded additional information output from the decoding section and (2) the decoded image frames output from the decoding section; and

an interpolation frame creation section operable to create an interpolation frame, considering the detected second motion vector as the first motion vector, such that the created interpolation frame is created based on the second motion vector, the decoded image frames output from the decoding section, and the decoded additional information output from the decoding section,

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wherein the interpolation frame creation section obtains an interpolation motion vector from the second motion vector based on a ratio between (1) a distance in a time axis direction between the decoded image frames and (2) a distance in a time axis direction from a position of one of the decoded image frames to an interpolation position of the interpolation frame for interpolating the image frames , and creates the interpolation frame based on the interpolation motion vector and the decoded image frames,

wherein, (A) when the additional information includes (i) an interpolation method for the interpolation frame with respect to the image frames, (ii) a motion detection method for detecting the first motion vector, and (iii) profile information specifying a combination of information that is related to the interpolation method and the motion detection method and that is included in the additional information, the interpolation frame creation section specifies information included in the additional information using the profile information and creates the interpolation frame based on the specified information included in the additional information, and

wherein, (B) when the additional information further includes at least one of (i) residual information of the interpolation frame and an image frame corresponding to the interpolation frame, and (ii) a vector difference between a motion vector of the interpolation frame detected with respect to the image frames and a motion vector of the interpolation frame derived based on the first motion vector with respect to the image frames, and when the additional information further includes the profile information specifying a combination of information that is related to (1) the interpolation method, (2) the motion detection method, (3) the residual information, and (4) the vector difference, and that is included in the additional information, the interpolation frame creation section specifies the information included in the additional information using the

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profile information and creates the interpolation frame based on the specified information included in the additional information.

Claim 19 (Currently Amended)   An integrated circuit device, comprising:

a first motion vector detection section operable to detect a first motion vector, which is a motion vector between image frames of an image signal;

an additional information producing section operable to produce additional information for creating an interpolation frame from the image frames and creating a motion vector for the interpolation frame, the motion vector being derived from the first motion vector based on a ratio between a distance in terms of time between the image frames and a distance in terms of time to an interpolation position of the interpolation frame, based on the first motion vector and the image frames; and

an encoding section operable to encode the image frames and the additional information,

wherein the additional information includes (i) an interpolation method for the interpolation frame with respect to the image frames, (ii) a motion detection method for detecting the first motion vector, and (iii) profile information specifying a combination of information that is related to the interpolation method and the motion detection method and that is included in the additional information, and

wherein, when a difference between an image frame obtained by a motion compensation processing section using the first motion vector and an image frame to be processed is equal to or greater than a predetermined threshold, the additional information further includes at least one of (i) residual information of the interpolation frame and an image frame corresponding to the interpolation frame, and (ii) a vector difference between a motion vector of the interpolation

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frame detected with respect to the image frames and a motion vector of the interpolation frame derived based on the first motion vector with respect to the image frames, and

wherein the profile information specifies a combination of information that is related to (1) the interpolation method, (2) the motion detection method, (3) the residual information, and (4) the vector difference, and that is included in the additional information.

Claim 20 (Currently Amended)   A non-transitory computer-readable recording medium having a decoding program recorded thereon, the decoding program causing a computer to execute a decoding method comprising:

a decoding step of decoding an encoded image signal obtained by encoding image frames of an image signal and by encoding additional information for creating an interpolation frame for interpolating the image frames based on a first motion vector that is a motion vector between the image frames, so as to output decoded image frames of the image signal and decoded additional information;

a motion vector detection step of detecting a second motion vector, which is a motion vector between the image frames of the encoded image signal decoded, based on (1) the decoded additional information output from the decoding step and (2) the decoded image frames output from the decoding step; and

an interpolation frame creation step of creating an interpolation frame, considering the detected second motion vector as the first motion vector, such that the created interpolation frame is created based on the second motion vector, the decoded image frames output from the decoding step, and the decoded additional information output from the decoding step,

wherein the interpolation frame creation step obtains an interpolation motion vector from the second motion vector based on a ratio between (1) a distance in a time axis direction between the decoded image frames and (2) a distance in a time axis direction from a position of one of the decoded image frames to an interpolation position of the interpolation frame for interpolating the image frames, and creates the interpolation frame based on the interpolation motion vector and the decoded image frames,

wherein, (A) when the additional information includes (i) an interpolation method for the interpolation frame with respect to the image frames, (ii) a motion detection method for detecting the first motion vector, and (iii) profile information specifying a combination of information that is related to the interpolation method and the motion detection method and that is included in the additional information, the interpolation frame creation step specifies information included in the additional information using the profile information and creates the interpolation frame based on the specified information included in the additional information, and

wherein, (B) when the additional information further includes at least one of (i) residual information of the interpolation frame and an image frame corresponding to the interpolation frame, and (ii) a vector difference between a motion vector of the interpolation frame detected with respect to the image frames and a motion vector of the interpolation frame derived based on the first motion vector with respect to the image frames, and when the additional information further includes the profile information specifying a combination of information that is related to (1) the interpolation method, (2) the motion detection method, (3) the residual information, and (4) the vector difference, and that is included in the additional information, the interpolation frame creation step specifies the information included in the additional information using the

profile information and creates the interpolation frame based on the specified information included in the additional information.

Claim 21 (Currently Amended)   A non-transitory computer-readable recording medium having an encoding program recorded thereon, the encoding program causing a computer to execute an encoding method comprising:

a first motion vector detection step of detecting a first motion vector, which is a motion vector between image frames of an image signal;

an additional information production step of producing additional information for creating an interpolation frame from the image frames and creating a motion vector for the interpolation frame, the motion vector being derived from the first motion vector based on a ratio between a distance in terms of time between the image frames and a distance in terms of time to an interpolation position of the interpolation frame, based on the first motion vector and the image frames; and

an encoding step of encoding the image frames and the additional information,

wherein the additional information includes (i) an interpolation method for the interpolation frame with respect to the image frames, (ii) a motion detection method for detecting the first motion vector, and (iii) profile information specifying a combination of information that is related to the interpolation method and the motion detection method and that is included in the additional information, and

wherein, when a difference between an image frame obtained by a motion compensation processing step using the first motion vector and an image frame to be processed is equal to or greater than a predetermined threshold, the additional information further includes at least one of

(i) residual information of the interpolation frame and an image frame corresponding to the interpolation frame, and (ii) a vector difference between a motion vector of the interpolation frame detected with respect to the image frames and a motion vector of the interpolation frame derived based on the first motion vector with respect to the image frames, and

wherein the profile information specifies a combination of information that is related to (1) the interpolation method, (2) the motion detection method, (3) the residual information, and (4) the vector difference, and that is included in the additional information.